

**DESIGNING AND DEVELOPING SINGLE PHASE DISTANCE
PROTECTION MODEL**

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ABSTRACT

Power system protection is the most important part beside load flow studies. The objective of the system protection system design is to minimize the fault that can damage the system. This paper presents a case study how distance protection relay operate and function when fault occurs at certain zone in line impedance. Since, there is impossible to study within the real part of the transmission line that can cause a hazard. The idea came to designing and developing single phase distance protection model in power system where the application nearly the same as the real one. This project can be a basic reference to the students who want to study about the system protection. This project divided into two section, hardware and PIC controller. About PIC controller, it has been making by my partner. The case study is involve hardware design to develop the distance protection model for the single phase of the power system and switching relay is control by Peripheral Interface Controller (PIC). It is related with the software design to make the hardware function properly.

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CHAPTER 1

BACKGROUND OF THESIS

1.1 Literature review

The degree project brings into focus on distance relay to protect line impedance in single phase distance protection model. Generally, the protection system is designed to decide the fault system element automatically when short circuit currents are high sufficient to present a direct danger to the element or to the system as a whole when the fault results in short circuit current [1]. The main goal of the degree project is to design and develop a concept for distance protection using component protection and other technique. In operation of distance relay is the current and voltage of the power system to determine whether a faults exists within or outside its operating zone [1]. The relay's zone of operation is a function of only the protected line impedance, which is a fixed constant, and is relatively independent of the current and voltage magnitudes.

Distance protection, in its basic form, is a non-unit system of protection offering considerable economic and technical advantages. Unlike phase and neutral over current protection, the key of distance protection is that its fault coverage of the protected circuit is virtually independent of source impedance variations [2]. Distance protection is comparatively simple to apply and it can be fast in operation for faults located along most of a protected circuit. It also provides both primary and remote back-up functions in a single scheme. It can easily be adapted to create a unit protection scheme when applied with a signaling channel [2]. The distance protection involves the division of the voltage at the relaying point by the measured current. The apparent impedance so calculated is compared with the reach point impedance. If the measured impedance is less than the reach